

**REMARKS**

By the above amendments, claim 1 is revised, claims 2, 18, 19, 21, and 22 are canceled, and new claims 27-31 are added to place this application in condition for allowance. Currently, claims 1, 3, 4, 6, 7 and 27-31 are before the Examiner for consideration on their merits.

In review, claim 1 has been to incorporate the limitations of claims 24 and 26 therein. Claim 27 is added as the combination of amended claim 1 and claim 2. New claims 28-31 parallel original claims 18, 19, 21, and 22.

The purpose of this response is to place the claims in condition for allowance by making them commensurate in scope with the comparative evidence of the specification, by the revisions to claim 1 as discussed below, and the submission of a separate set of claims that include a heating step as part of the claimed process.

The response is divided between the arguments in favor of claims 1, 3, 4, 6, and 7, and new claims 27-31.

**Claims 1, 3, 4, 6, and 7**

Applicants have previously argued that the two stage heating process of claim 1 produced unexpected benefits. These unexpected benefits are shown via Tables 1-5, see pages 21-23 of the specification.

In more detail, Table 2 shows five different surface treatments as Nos. 1-5. These five different surface treatments are linked to different steel compositions and heating conditions in Table 3. Table 3 also has four comparison tests using two of the

five surface treatments. Table 5 reveals that the five different surface treatments that involved two stage heating conditions falling within the claimed processing limits provided unexpectedly superior properties in terms of seizing and galling. Table 5 also reveals that the four comparison tests (using surface treatment conditions 1 and 2) that did not abide by the heating conditions of claim 1, 2 demonstrated extremely poor performance from a galling and seizure standpoint.

What this comparison demonstrates is that for the same surface treatment 1 or 2, which is either the polyamideimide resin and MoS<sub>2</sub> or the epoxy resin and the combination of MoS<sub>2</sub> and graphite, following the heating conditions of claim 1 produced superior properties whereas not abiding by the heating conditions of claim 1 produced a vastly inferior product.

These unexpected results were acknowledged by the Examiner in the outstanding Office Action on page 4, lines 3-17 as rebutting the allegation of obviousness. In this acknowledgement, the Examiner took the position that the claims were not in condition for allowance though since they were not commensurate in scope with the showing made in the specification. The primary reasoning was that claim 1 was drawn to any resin and the showing of unexpected results did not support covering any resin as part of the surface treatment. The same reasoning was applied with respect to the lubricating composition of claim 1.

Applicants concede for the moment that a *prima facie* case of obviousness is established and wish to seek patentability of claim 1 in its amended form based on the comparative showing of the specification. This concession is seen in claim 1 and its

limitation to the actual resins used in Test Nos. 1-7. It is submitted that since each of the resins now claimed have been shown to have superior and unexpected properties in the context of the heating regimen of claim 1, the submission of claim 1 in its revised form means that claim 1 is commensurate in scope with the comparison set forth in the specification.

The same argument applies regarding the lubricating composition. Claim 1 now limits the lubricating composition to the three specific lubricants used in the comparison discussed above, graphite, WS<sub>2</sub> and MoS<sub>2</sub>. While it is true that graphite is not used by itself in the comparison but only in combination with MoS<sub>2</sub>, this does not mean that graphite cannot be considered to be one of the listed lubricants in claim 1 that could be used to achieve the aims of the invention.

That is, the unobviousness of claim 1 in terms of specifying a lubricating composition of graphite or MoS<sub>2</sub> in combination with one of the claimed resins can be supported based on the existing comparative evidence. As explained in MPEP Section 716.02(d)(I), unobviousness is based on whether one of ordinary skill in the art would be able to determine a trend in the exemplified data that would allow the artisan to reasonably extend the probative value thereof.

In the instant situation, the question is whether one would expect the same results to be obtained when using graphite alone as the lubricating composition. The first point to be noted here is that graphite is used as one of the lubricants, see for example surface treatment No. 2 of Table 2, without any adverse affect on seizing. This means that no adverse effect occurs as a result of the presence of graphite. As

evidenced by the MoS<sub>2</sub> and graphite-containing comparative Test Nos. 1 and 3 of Table 5, the adverse effect is a result of not following the heating regimen of claim 1, not the presence or absence of graphite.

The second point on this issue is that the prior art groups MoS<sub>2</sub> and graphite together as additives for lubricating greases, see WO 93/06197 to Vik, page 6, lines 9-16. What this means is that one of skill in the art would expect that the data of improved seizing by practicing the method of claim 1 would be expected to occur when the lubricant composition is graphite. In this regard, it must be remembered again that the critical aspect of the invention is the heating regimen, not the particular type of lubricant being used. This is demonstrated by the fact that the surface treatments use three different lubricants, MoS<sub>2</sub>, MoS<sub>2</sub> + graphite, and WS<sub>2</sub>, and each of the three different lubricants results in the same unexpected performance with respect to galling/seizing. This data would exemplify a trend that would tell one of skill in the art that using graphite alone would produce similar results as using similar lubricating compositions, particularly one that includes graphite as a component thereof, surface treatment No. 2.

Therefore, it is submitted that claim 1, as amended, is commensurate in scope with the showing in the specification.

The Examiner's comments in the Office Action that the unexpected results have only been shown with respect to the polyamideimide resin, epoxy resin, and the MoS<sub>2</sub> powder are noted. However, Applicants submit that this observation fails to take into account the entirety of Applicants' comparative evidence in demonstrating the

unexpected benefits when practicing the heating regimen of claim 1. For example, in Table 2, surface treatment No. 3 uses phenolic resin and WS<sub>2</sub> and the seizing results when this material is subjected to the inventive heating regimen are comparable to those of surface treatment Nos. 1 and 2. These results indicate that Applicants should be entitled to the claimed heating regimen when using this resin and lubricating composition as well as the ones used in surface treatments Nos. 1 and 2. While a comparison was not made using the surface treatment No. 3 and a heating regimen that would be outside the claimed heating regimen, the fact that the same results in terms of seizing/galling are realized for each of surface treatment Nos. 1-3 implies that claim 1, as revised, is also unobviousness when defining the resin as a phenolic resin and the lubricating composition as WS<sub>2</sub>.

In the Advisory Action, the Examiner continues to allege that the comparative evidence was not commensurate in scope with the claims. Specific points of contention were the sizes of the pin and box, the number of solvents, the specific steels, and the treating conditions. Applicants submit that the failure to compare different size pins and boxes, different solvents, and different steels is not fatal to the demonstration of unexpected results. As noted above, the unobviousness of a broader claimed range can, in certain instances, be proven by a narrower range of data. This is possible is one of skill in the art would be able to ascertain a trend in the exemplified data which would allow the artisan to reasonably extend the probative value of the data. *In re Kollman*, 201 USPQ 193 (CCPA 1979).

In the Advisory Action, the Examiner implies that other sizes of boxes and pins as well as steels must be tested in order to demonstrate the patentability of the claim. It is contended that the Examiner is applying an overly strict standard in connection with the evaluation of the comparative evidence found in the specification. In *In re Cescon* 177 USPQ 264 (CCPA 1973), the CCPA found that if the objective evidence submitted was sufficient to rebut the allegation of obviousness, even though not all compounds encompassed by the claims were tested. In finding so, the court stated:

Our disagreement with the action of the Patent Office at this level arises from overly stringent standards set up for evaluating appellant's objective evidence. It is true that the claims are broadly drawn to the presence of the imidazolyls in the environment of an inert solvent or substrate. The examples providing comparisons with analogously substituted isomers or unsubstituted imidazoles, on the other hand, are limited to the use of a benzene solution. Not all compounds encompassed by the claims are tested. But ample data has been provided to establish the correlation between the ortho substitution on the 2-phenyl ring and greatly increased color fading rates. Moreover, no factual basis appears in the record for expecting compounds to behave differently in other environments.

It is submitted that, in the context of the process of claim 1, there is no expectation that the process would behave differently if the pin and box had different dimensions than the ones tested. The nature of the process is one of surface treatment by applying a coating fluid to the contact surface. One of skill in the art would expect the same performance regardless of the size of the pin and/or box. Therefore, Applicants should not be required to submit testing with different size pins and boxes.

The same argument applies for the types of steel being used. Table 3 shows that the same unexpected improvements occur for different compositions of steels. With this, one would expect that the improvements with respect to galling and seizures

would occur in general, providing the process conditions of claim 1 are met. Moreover, there is no evidence on the record that would indicate expectation of a different behavior. If the Examiner continues with this objection, a factual basis is requested to support the contention that other steels would not behave in a similar fashion.

The same argument applies for the choice of solvent. Three different solvents were used to form the coating fluid. Each of these three solvents when used in accordance with the invention was found to exhibit the unexpected results in terms of seizing and galling. Two different solvents were used in the comparisons. From this, the artisan could reasonably conclude that other solvents would work just as well as those exemplified. In addition, there is nothing on the record to indicate that the using different solvents would make the process produce unacceptable results. Therefore, Applicants are not required to test other solvents to demonstrate the unobviousness of the claimed process.

What must be remembered is that the issue of obviousness relates to the two stage heating step employed in claim 1 versus the one stage heating used in the prior art. The comparative evidence of the specification shows that when the two stage heating is employed versus a one stage heating, unexpected improvements are attained in terms of seizing and galling of the pipe threaded connection. The invention is not the criticality of the size of the pins and boxes, the specific type of steel or solvent. One of skill in the art would recognize that these variables are not the ones that make a difference in terms of the unexpected improvements and it is reasonable to expect the same performance when variance occurs with respect to these variables.

To summarize, it is submitted that any allegation of unobviousness is effectively rebutted by the comparison of Tables 1-5 of the specification. In addition, claim 1, which limits the resin to the three resins used in the comparison and also limits the lubricant to the three lubricants used in the comparison means that claim 1 is commensurate in scope with the demonstration of unexpected results.

Accordingly, even if Applicants concede that either Tsuru alone or Tsuru in combination with Takamori establishes a *prima facie* case of obviousness against claim 1, this *prima facie* case of obviousness is rebutted by the showing in the specification and the revision to claim 1. Thus, the rejection as applied to claim 1 and its dependent claims should be withdrawn.

#### Claims 27-31

Claim 27 is rewritten into independent form to specifically address the issue raised in the Advisory Action regarding the preheating of the steel. That is, the Examiner indicated that the comparative evidence was not commensurate in scope with the claim since claim 1 did not require a preheating step. This objection is moot when considering claim 27 and the requirement that the surface is heated prior to the coating application step. Moreover, the heating range tracks the preheating used in the comparative evidence. As pointed out by the Examiner, preheating temperatures of 100 to 180 °C were employed, which is reasonably commensurate with the claimed range of 50-200 °C. Therefore, there can be no objection regarding the fact that there was no preheating step in the claims.

The other issues regarding claim 27 and the limitations regarding pin and box size, type of steel, and the solvent are addressed above for claim 1. Taking into account these arguments, any *prima facie* case of obviousness against claim 27 is effectively rebutted by the showing in the specification.

Accordingly, the Examiner is requested to examine this application and pass all pending claims onto issuance.

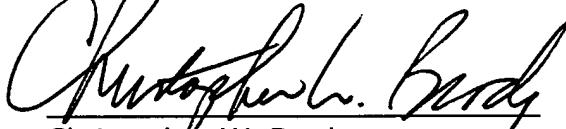
If an interview with Applicant's attorney would expedite allowance of this application, the Examiner is invited to telephone the undersigned at 202-835-1753.

The above constitutes a complete response to all issues raised in the Office Action dated December 4, 2007 and the Advisory Action of May 12, 2008.

Again, reconsideration and allowance of this application is respectfully requested.

Applicant petitions for a three month extension of time. A check in the amount of \$590.00 is attached, which is the difference between the already paid extension of time fee of \$460.00 and the three month extension of time fee of \$1,050.00. Please charge any fee deficiency or credit any overpayment to Deposit Account No. 50-1088.

Respectfully submitted,  
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